An Object-Oriented Record: Maximizing Benefits to Support the Use of Controlled Terminology

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One of the challenges to automating the health record is to achieve consistent, direct information entry by clinicians. This challenge can be met by providing efficient, robust documentation tools and by demonstrating an immediate and profound benefit from their efforts. Projects are underway that attempt to address the design challenges associated with realizing the maximum benefits available through automation of the health record. One of these projects is a joint development partnership between Oceania, Inc. and Kaiser Permanente, Southern California Region. Over the past 18 months, physicians and nurses have been using Oceania's software tools to capture clinical documentation using controlled terminology. This opportunity to learn together has enabled an on-going refinement of design based on clinical experience.

Oceania's design provides data entry tools which can be used directly by clinicians to create documentation using controlled terminology. Documentation using this methodology creates an object-oriented electronic record that benefits the user and is enriched in value over its paper predecessor.

Basic Ingredients of the Object-Oriented Record

The object-oriented record is based on document objects, clinical objects and the capturing of their relationships in the content and context within which they are expressed.

Document Objects
A document object is an authenticated entry into the record. The object supports clinical documentation ranging from the capture one data point - such as serum potassium lab result - to a comprehensive History & Physical.

Chart Objects
Chart objects are clinically relevant entities created within document-objects which have a longitudinal presence within the chart and across documentation efforts. Objects include problems, procedures, encounters, medications and adverse reactions, etc. A summarized display supports review of the current state as well as historical changes to these objects. These clinical objects are generated and maintained in a non-redundant fashion; each object update is a by-product of the process of standard documentation. This automated interaction significantly decreases the errors and omissions found in patient health summaries in the paper chart.

Object Relationships
Relationships between chart objects and between document objects are identified and automatically captured in the process of documentation. They can be explicitly captured, e.g. a care giver documenting an indication for a procedure, or implicitly captured, e.g. medications ordered during an encounter. Capturing object relationships is a key factor to enhancing the value of the record and can only be duplicated in the paper chart by redundant data entry.

Content and Context

The record is enriched by its ability to capture context along with content. The value of the content itself is enhanced because the data elements are captured in standardized terminology which can be queried for analysis and reporting. There are two major components of captured context. The first is the captured structure inherent in the document architecture. Document types have inherent context, e.g., an H&P versus a Consultation. Within each document are recursive levels of structure which are captured along with each data element documented. This structural context is captured in a data stream or thread along with the document. The second aspect to context is the captured relationships. These implicit and explicit relationships between clinical entities present an inter-linked longitudinal view of the patient's care.

Summary

There is still much to learn about automating the health record and maximizing its use by clinicians. A key is to focus on providing user benefits only achievable through automation.

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